

Gasbuggy ...an Offsites Project

Background

During the Cold War, nuclear testing activities were conducted at sites in five states. One of these sites is located in northwestern New Mexico, approximately 55 miles east of the town Farmington. This site was the location of one nuclear test, designated Gasbuggy, detonated in the late 1960s.

In addition to restoring sites on the Nevada Test Site, the U.S. Department of Energy Nevada Site Office (NSO) is responsible for environmental restoration activities at Offsites locations in New Mexico, Colorado, Mississippi, and Alaska. At the Gasbuggy site in New Mexico, NSO is moving toward finalizing surface closure and establishing long-term surveillance and monitoring programs.

History

The U.S. Atomic Energy Commission (predecessor agency to the DOE) partnered with the U.S.

Department of the Interior and a privately-owned natural gas company to conduct the Gasbuggy test.

Gasbuggy, a twenty-nine kiloton device, was detonated on December 10, 1967 at approximately 4,240 feet below the earth's surface.

The Gasbuggy site is part of the NSO's Environmental Management Offsites project, which encompasses various sites in several states where underground nuclear tests and experiments were performed outside of the Nevada Test Site. Locations include Alaska, Colorado, Mississippi, Nevada, and New Mexico. Under the Offsites project, NSO is responsible for addressing possible contamination associated with nuclear testing activities and carrying out appropriate corrective actions.

Gasbuggy was one of 27 nuclear tests conducted under the Plowshare program. The Plowshare program's objective was to determine how energy generated from nuclear explosions could be used for scientific, industrial, or civilian purposes. Potential uses included: providing information on development and improvement of explosives, creating underground zones of fractured oil shale, stimulating natural gas production, and rapid excavation for large-scale construction projects such as harbors, canals, or mountain passes.



Gasbuggy was the first joint government-industry experiment of its kind, as well as the first nuclear gas stimulation experiment. The experiment was designed to increase natural gas production by using a nuclear explosion to stimulate natural gas recovery by fracturing gas-bearing formations in tight underground reservoirs.

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Restoration Efforts

The Atomic Energy Commission conducted an initial site cleanup to decommission, or close down, the site in 1978. Activities included removing structures, burying radioactive waste deep within the test cavity, and plugging groundwater monitoring wells. Since that time, the DOE has performed various surveys and sampling efforts to monitor the site, including soil sampling in 1978 and 1986, radiological, floodplains, and wetlands surveys in 1993, and a cultural resources survey, sensitive species survey, surface geophysical surveys, and soil sampling and analysis in 2000. Information from the 2000 survey provided data to aid in the development of a Site Characterization Plan, which was submitted to the state of New Mexico in fiscal year 2001.

Scientists have completed additional surface studies to characterize both surface and near surface conditions at the Gasbuggy site. Soil samples were collected for analysis, and geophysical surveys were done to determine the extent and level of contamination in the surface and shallow sub-surface soils. Information is being used to verify the data collected during previous restoration activities and to identify and determine if any corrective actions may be needed to ensure the protection of human health and the surrounding environment.



Characterization work was completed in 2002.

Previous surveys have indicated that there is no surface risk to the public, thus the surface of the site is currently open for unrestricted use. However, administrative controls do exist for the subsurface. Once all objectives for surface characterization and restoration have been achieved, the NSO intends to release the surface area to the U.S. Forest Service.

Path Forward

The NSO is implementing a strategy to better understand the subsurface at the Gasbuggy site, including characterizing groundwater flow, determining the area of contamination, assessing risk to human health, and modeling contaminant movement away from the test cavity.

Subsurface site information will be evaluated to establish the subsurface conditions at the site. Based on this evaluation, the NSO will determine the technical need to install subsurface wells and conduct additional testing to fill potential data gaps.

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